2002 SCHEME

USN | | | | | | | | | | |

CS53

Fifth Semester B.E. Degree Examination, December 2010

Database Management Systems

Time: 3 hrs. Max. Marks:100

Note: *Answer any FIVE full questions.*

1 a. Discuss the main characteristics of the database approach. How does it differ from the traditional file systems? **(10 Marks)**

b. What is the difference between logical data independence and physical data independence? **(05 Marks)**

c. Discuss the conventions for displaying an ER schema as an ER diagram. **(05 Marks)**

2 a. Discuss the entity integrity and referential integrity constraints. Why is each considered important? **(10 Marks)**

b. Explain how the different update operations deal with constraint violations. **(10 Marks)**

3 a. List the operations of relational algebra and the purpose of each. **(10 Marks)**

b. Consider the following relations for a database of the company:
Employee (name, ENo, sex, salary, super No, DNo.)
Department (Dname, Dnumber, Mgr No)
Dept locations (Dnumber, Dlocations)
Project (Pname, Pnumber, Plocations, Dnumber)
Works ON (EENo., PNo., Hours)
Dependent (EENo., Dependent name, sex)
Specify the following queries in relational algebra :

i) Retrieve the name and address of all the employees who work for the design department

ii) Find the names of employees who work on all the projects controlled by department No.3

iii) Retrieve the names of employees who have no dependents. **(10 Marks)**

4 a. Discuss the correspondences between the ER model constructs and the relational model constructs. Show how each ER model construct can be mapped to the relational model. **(10 Marks)**

b. Describe the six clauses in the syntax of an SQL query and show what types of constructs can be specified in each of the six clauses? Which of the six clauses are required and which are optional? **(10 Marks)**

5 a. Considering database schema of problem of Q3(b) above, specify the following queries in SQL:

i) Show the resulting salaries if every employees working on the product X project is given a ten percent raise.

ii) For every project located in Chennai, list the project number, the controlling department number and the department manager's last name and address.

iii) Retrieve the names of employees who have no dependents. **(10 Marks)**

b. Discuss insertion, deletion and modification anomalies. Why are they considered bad? Illustrate with an example. **(10 Marks)**

6 a. Define and explain the first second and third normal forms. **(10 Marks)**

b. What is the lossless (or non additive) join property of decomposition? Why is it important? **(10 Marks)**

7 a. Define the fourth normal forms. When is it violated? Why is it useful? **(10 Marks)**

b. What is the difference between discretionary and mandatory access control? **(06 Marks)**

c. List the types of privileges available in SQL. **(04 Marks)**

8 a. Discuss the ACID properties of a database transaction. **(04 Marks)**

b. Discuss the problems of deadlock and starvation and the different approaches to dealing with these problems. **(08 Marks)**

c. Describe the three phases of the ARIES recovery model. **(08 Marks)**

* * * * *